# UNITED STATES PATENT AND TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/634,723 | 08/05/2003 | Bane Vasic | I69.12-0555 | 8640 |

| 164 | 7590 | 12/01/2005 | EXAMINER |
|---|---|---|---|

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| ART UNIT | PAPER NUMBER |
|---|---|
| 2133 | |

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | Application No. | | Applicant(s) | |
|---|---|---|---|---|
| **Office Action Summary** | 10/634,723 | | VASIC ET AL. | |
| | Examiner | | Art Unit | |
| | Fritz Alphonse | | 2133 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on <u>05 August 2003</u>.

2a)☐ This action is **FINAL**.  2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) <u>1-25</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-25</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>05 August 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All  b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date <u>4 and 16</u>.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Objections*

1.       Claim 3 is objected to because of the following informalities: the claim should end in a

dot.  Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2.       The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3.       Claims 1-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Khayrallah (U.S.

Pat. No. 5,926,488).

As to claim 1, Khayrallah (figs. 1-2) shows a system for decoding Reed-Muller coded

information comprising a soft-output device for processing a coded signal and for producing

code bit decisions and code bit reliabilities based on the coded signal (col. 3, lines 20-44).

Khayrallah discloses (figs. 1-2) teaches a Reed-Muller message passing device for decoding the

code bit decisions and decoding the code bit reliabilities into an information bit decision and an

information bit reliability vector (fig. 2; col. 3, lines 45 through col. 4 line 6).

As to claim 2, Khayrallah (figs. 1-2) shows a system including an assembler (i.e., channel

decoder 120) for combining the message bit reliabilities into a code word reliability vector for

use in a second soft-output device, wherein each element of the code word reliability vector is a

code bit reliability number (col. 3, lines 34-44; col. 9, lines 1-10).

As to claim 3, the claim has substantially the limitations of claims 1-2; therefore, it is analyzed as previously discussed in claims 1-2 above.

As to claims 4-5, Khayrallah discloses a system including and interleaver (110), wherein the coded signal is an interleaved coded signal (fig. 1; col. 1, lines 40-48), the system further comprising a de-interleaver (118) positioned between the soft-output device and the Reed Muller message passing device for recovering an original sequence of coded information from a received sequence.

As to claims 6-7, method claims 6 and 7 corresponds to apparatus claim 1; therefore, they are analyzed as previously discussed in claim 1 above.

As to claims 8-9, Khayrallah (fig. 2) discloses a method comprising: de-interleaving the code bit vector and the bit reliability vector and interleaving at least the codeword reliability for use in a next soft-output device.

As to claims 10-11, method claims 10-11 correspond to apparatus claims 1-2; therefore, they are analyzed as previously discussed in claims 1-2 above.

As to claim 12, Khayrallah (figs. 1-2) shows a soft iterative decoding system comprising: two or more decoding blocks for processing coded information into a decoded bit vector and a decoded probability vector (fig. 1; col. 2, lines 64 through col. 3 line 18), each decoding block comprising: a soft-output device for processing the coded information according to a code word probability vector into a code bit information vector and an associated code bit reliability vector (fig. 2; col. 3, lines 20-44); and a Reed-Muller device for decoding the code bit information vector and the associated code bit reliability vector (fig. 2; col. 3, lines 45 through col. 3 line 6). Khayrallah discloses an assembler device (i.e., channel decoder 120) between each decoding

block for processing the code bit information vector and the associated code bit reliability vector from a previous decoding block into a codeword vector and an associated codeword reliability vector for a next decoding block (col. 3, lines 34-44; col. 9, lines 1-10).

As to claims 13-16, Khayrallah discloses a system, wherein the coded information is interleaved, the system further comprises a de-interleaver for re-ordering a bit sequence of the code bit information vector and the associated code bit reliability vector (fig. 1; col. 3, lines 20-44). Khayrallah (fig. 1) discloses a system, wherein each soft-output device of the two or more decoding blocks has two inputs, a first input for receiving the coded information and a second input for receiving a code word reliability vector, and wherein each soft-output device has two outputs, the code bit information vector and the associated code bit reliability vector.

As to claim 17, method claim 17 corresponds to apparatus claim 12; therefore, it is analyzed as previously discussed in claim 12 above.

As to claims 18-20, Khayrallah discloses a method of computing comprises: processing the Reed-Muller coded signal to generate an information bit vector and a information bit probability; and outputting both the information bit vector and the information bit probability for further processing (col. 3, lines 34-44; col. 9, lines 1-10).

As to claim 21, the claim has substantially the limitations of claim 12; therefore, it is analyzed as previously discussed in claim 12 above.

As to claims 22-23, Khayrallah (fig. 1) discloses an iterative decoding system, wherein the message bit likelihoods are log likelihood ratios for the message (col. 8, lines 35-46); the system further comprises an interleaver (110) disposed both between each soft input device and

each Reed-Muller message passing device and between each decoding block in the sequence of decoding blocks.

As to claims 24-25, Khayrallah discloses an iterative decoding system, wherein the system is implemented in a circuit (see figure 2); and, wherein the connections are logical connections.

### Conclusion

4.      The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892

5.      Any response to this action should be mailed to:

Commissioner of Patents and Trademarks, Washington, D.C. 20231

**or faxed to:** (703) 872-9306 for all formal communications.

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, <u>Fourth Floor</u> (Receptionist).

6.      Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fritz Alphonse, whose telephone number is (571) 272-3813. The examiner can normally be reached on M-F, 8:30-6:00, Alt. Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert De Cady, can be reached at (571) 272-3819.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-3824.

Information regarding the status of an application may also be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Fritz Alphonse

Art Unit 2133

November 25, 2005

GUY LAMARRE
PRIMARY EXAMINER